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eLcos-0303(10/645,988)

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Edwin Lyle Hudson :Date: October 8, 2007
Serial No.: 10/645,988 :Group No.: 2675
Filed: August 22, 2003 :Examiner: Donna Lui
Attorney Docket No.: eLcos-0303 :@(571)272-4920,273-8300(F)

CERTIFICATION UNDER 37 CFR 1.10

I hereby certify that this Office Response Transmittal and the documents referred to as enclosed therein are being deposited with the United States Postal Service on this date **October 8, 2007** in an envelope as "Express Mail Post Office to Addressee" Mailing Label Number **EB677051915 US** addressed to the: Commissioner of Patents and Trademarks, Alexandria, VA 22313-1450.

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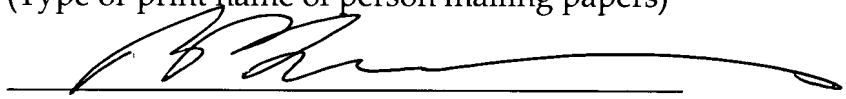

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To the Commissioner of Patents and Trademarks:

AMENDMENT

Dear Sir:

In response to the Examiner's Action mailed on April 9, 2007, please amend the above referenced Application as set forth below. The Applicant hereby respectfully request a three-month extension to respond with an extension Fee of $510.00 enclosed.

I) Please amend claims 1-4, 6-7, 14-15, 19-21, and 25-26 as set forth below:

10/10/2007 TNGUYEN2 00000067 10645988
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(Currently Amended) 1. A liquid crystal display (LCD) system implemented with a thermal control and management system comprising

a temperature sensor system disposed directly on a backplane of a silicon die of a LCD microdisplay device immediately next to a liquid crystal material for directly measuring a temperature of said microdisplay device and generating a frequency output by a voltage control oscillator (VCO) as a temperature measurement signal;

a microdisplay controller for controlling voltages of said microdisplay device and receiving said temperature signal for transmitting a digital signal to a system processor; and

said system processor processing said digital signal corresponding to said temperature of said microdisplay device to generate temperature-dependent reference signals for inputting to a said microdisplay controller for controlling said voltages of said microdisplay device in response to said temperature measurement signal.

(Currently Amended) 2. The LCD system of claim 1 wherein:

said system processor inputting said temperature dependent reference signals into a multiplexer of said microdisplay controller for generating a temperature-dependent black state voltage and a temperature-dependent white state voltage applied to a common electrode connected to a plurality of pixel cells for controlling said voltages of said microdisplay device in response to said temperature measurement signal.

(Currently Amended) 3. The LCD system of claim 1 wherein:

said microdisplay controller further includes a control register for loading and reading said temperature measurement signal as a digital word.

(Currently Amended) 4. The LCD system of claim 3 wherein:

said microdisplay controller further includes a digital-to-analog converter (DAC) for converting said frequency output as said temperature measurement signal ~~dependent signals~~ received from said temperature sensor system as temperature dependent voltages.

(Previously Presented) 5. The LCD system of claim 1 wherein:

said system processor further interpolating between two data in a database for generating said temperature dependent reference signals for inputting to said microdisplay controller.

(Currently Amended) 6. The LCD system of claim 1 wherein:

said temperature sensor system further integrated as an integrated circuit (IC) chip disposed directly on said backplane of a silicon die immediately next to a liquid crystal material of said LCD microdisplay device.

(Currently Amended) 7. The LCD system of claim 1 wherein:

said temperature sensor system further comprising a PTAT temperature sensor system and integrated as an IC chip disposed directly on said backplane of ~~a~~ said silicon die immediately next to said liquid crystal material of said LCD microdisplay device for generating a frequency output by a voltage control oscillator (VCO) as a temperature measurement signal.

(Previously Presented) 8. The LCD system of claim 1 wherein:

said system processor further includes an additional cooling activating system to activate additional cooling for said LCD microdisplay device in response to said temperature measurement signal.

(Previously Presented) 9. The LCD system of claim 1 wherein:

said system processor further determining if said temperature measurement signal is within a predefined range.

(Previously Presented) 10. The LCD system of claim 1 wherein:

said system processor_further_receiving and processing said temperature measurement signal to function as a part of a Peltier thermal control loop.

(Previously Presented) 11. The LCD system of claim 1 wherein:

said microdisplay controller controlling said voltages of said microdisplay device in response to said temperature measurement signal for operating said LCD microdisplay device as a liquid crystal display device of a normally white mode device.

(Previously Presented) 12. The LCD system of claim 1 wherein:

said microdisplay controller controlling said voltages of said microdisplay device in response to said temperature measurement signal for operating said LCD microdisplay device as a liquid crystal display device of a normally black mode device.

(Previously Presented) 13. The LCD system of claim 4 wherein:

said DAC further comprising a resistor digital to analog converter (RDAC).

(Currently Amended) 14. A liquid crystal display (LCD) system comprising:

a thermal control and management system having a voltage database for receiving and processing a microdisplay temperature measurement signal for said LCD system by employing said voltage database to generate a temperature-dependent reference voltage for inputting to multiplexer of a microdisplay controller for controlling a high and a low voltages of a common electrode for controlling a high and low voltages of a liquid crystal panel supporting a plurality of pixel cells switchable for a DC balancing of said LCD display system whereby higher speed of DC balancing switch of said LCD system can be accomplished.

(Currently Amended) 15. The liquid crystal display (LCD) system of claim 14 wherein:

said microdisplay controller further generating a temperature-dependent black state voltage and a white state voltage as said switchable temperature-dependent reference voltages of said liquid crystal panel in response to said temperature measurement signal for DC balancing said LCD display system.

(Previously Presented) 16. The liquid crystal display (LCD) system of claim 15 wherein:

said microdisplay controller further includes a control register for loading and reading said temperature measurement signal.

(Previously Presented) 17. The liquid crystal display (LCD) system of claim 15 wherein:

said system processor further includes DAC output circuits for outputting said temperature dependent reference voltages.

(Previously Presented) 18. The liquid crystal display (LCD) system of claim 15 wherein:

said system processor further interpolating between two data in said database for generating said temperature dependent reference voltages.

(Currently Amended) 19. The liquid crystal display (LCD) system of claim 14 further comprising:

said temperature sensor system is further integrated as an integrated circuit chip disposed directly on a backplane of a silicon die of a LCD microdisplay device immediately next to a liquid crystal material in said LCD system for generating a frequency output by a voltage control oscillator (VCO) as a temperature measurement signal.

(Currently Amended) 20. A method for temperature control and compensation for a microdisplay system comprising:

receiving and processing a microdisplay temperature measurement signal from said microdisplay system by employing a voltage database to generate a temperature-dependent reference high and low voltages; and

inputting said temperature-dependent high and low reference voltages into a multiplexer of a microdisplay DC-balancing controller for controlling voltages of common electrodes connected to a liquid crystal panel supporting a plurality of pixel cells of said microdisplay system in response to said temperature measurement signal for DC balancing said LCD system.

(Currently Amended) 21. The method of claim 20 further comprising:

said step of generating said temperature-dependent high and low reference voltages further comprising a step of multiplexing and generating a temperature-dependent black state voltage and a white state voltage according to a DC balancing state for controlling voltages of said common electrodes connected to said liquid crystal panel supporting said plurality of pixel cells of said microdisplay system in response to said temperature measurement signal for DC balancing said LCD system.

(Previously Presented) 22. The method of claim 20 wherein:

said step of receiving and processing said temperature measurement signal from said microdisplay further includes a step of receiving said temperature measurement signal into a system processor having a control register for loading and reading said temperature measurement signal.

(Previously Presented) 23. The method of claim 20 wherein:

said step of generating said temperature-dependent reference voltages further comprising a step of outputting said temperature-dependent reference voltages through DAC output circuits to said multiplexer.

(Previously Presented) 24. The method of claim 20 wherein:

said step employing said voltage database for generating said temperature-dependent reference voltages further comprising a step of applying said temperature measurement signal for interpolating between two data in said database for generating said temperature dependent reference voltages.

(Currently Amended) 25. The method of claim 20 further comprising:

employing a temperature sensor system integrated as an integrated circuit chip disposed directly on a backplane of a silicon die immediately next to a liquid crystal material of a LCD microdisplay device of said microdisplay system <u>for generating a frequency output by a voltage control oscillator (VCO) as a temperature measurement signal</u>.

(Currently Amended) 26. The method of claim 20 wherein:

said step employing said voltage database for generating said temperature-dependent reference voltages further comprising a step of applying said temperature measurement signal for carrying out a curve-fitting algorithm using data in said database for generating said temperature dependent reference voltages to said common electrodes connected to said liquid crystal panel supporting said plurality of pixel cells of said LCD system.